

1 **Amendment to the Claims**

2 **In the Claims:**

3 Please cancel Claims 41, 45, 47, 48, 52, and 53.

4 Also, please amend Claims 34, 35, 37, 39, 40, 42, 43, 45, 46 and 51, and add new Claim 54  
5 and 55, as follows:

6 Claims 1-33 (Previously Canceled)

7 34. (Currently Amended) A method for detecting a feature using an imaging system, where  
8 the feature is part of an object and a probe can be attached to the feature, comprising the steps of:

9 (a) providing at least one ~~labeled~~ probe that selectively binds to said feature,  
10 wherein said at least one ~~labeled~~ probe comprises a binding element that selectively binds to at least a  
11 portion of said feature, and at least one optical signaling component;

12 (b) exposing said object to said at least one ~~labeled~~ probe under conditions that  
13 cause said at least one ~~labeled~~ probe to bind to at least a portion of said feature, if said feature is part  
14 of said object, such that a plurality of different optical signaling components become bound to said  
15 feature;

16 (c) collecting light from said object along a collection path, the light that is collected  
17 comprising light corresponding to each of the plurality of different optical signaling components that has  
18 been simultaneously collected;

19 (d) ~~focusing the collected light to produce an image corresponding to the object~~  
20 ~~locations of labeled probes bound to said feature included in the image being optically discriminated but~~  
21 ~~not spatially discriminated in the image~~ dispersing the light that is traveling along the collection path  
22 into a plurality of light beams, as a function of a plurality of different discriminable characteristics of  
23 the light;

24 (e) ~~detecting the image to produce a signal indicative of each optical signaling~~  
25 ~~component bound to said feature; and~~ focusing each of the plurality of light beams to produce a respective  
26 image corresponding to that light beam, thereby simultaneously generating a plurality of images, locations  
27 of probes bound to said feature included in the plurality of images being optically discriminated;

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1 (f) ~~analyzing the signal to determine if a spectral component due to each optical~~  
2 ~~signaling component bound to said feature is present in the image, thereby establishing that said feature~~  
3 ~~is part of the object; detecting the plurality of images to produce a signal indicative of each optical~~  
4 ~~signaling component, such that a different signal is produced for each of the plurality of images; and~~

5 (g) analyzing each different signal produced for each of the plurality of images to  
6 determine if indicative spectral signals produced by the plurality of different optical signaling  
7 components are present, thereby establishing that the feature is part of the object.

8 35. (Currently Amended) The method of Claim 34, wherein the step of exposing said object  
9 to said at least one ~~labeled~~-probe comprises the step of exposing said object to a ~~labeled~~-probe that  
10 comprises said plurality of different optical signaling components, thereby binding said plurality of  
11 optical signaling components to said feature.

12 36. (Previously Canceled)

13 37. (Currently Amended) The method of Claim 34, wherein the step of analyzing ~~the signal~~  
14 each different signal produced for each of the plurality of images comprises the step of determining if an  
15 intensity of a waveband of light indicative of said plurality of different optical signaling components  
16 is present in [[the]] that image.

17 38. (Previously Presented) The method of Claim 34, wherein said object comprises a  
18 biological cell, and said feature comprises a cellular component.

19 39. (Currently Amended) The method of Claim 34, wherein the step of analyzing ~~the signal~~  
20 each different signal produced for each of the plurality of images comprises the step of determining if a  
21 multiplex of a spectral signature for each of the plurality of different optical signaling components is  
22 present in [[the]] that image.

23 40. (Currently Amended) The method of Claim 34, wherein the step of exposing said object  
24 to at least one ~~labeled~~-probe comprises the step of exposing said object to at least two ~~labeled~~ probes,  
25 each of which comprises a binding element that selectively binds to at least a portion of the feature,  
26 each of which comprises at least one optical signaling component, one of which includes a different  
27 optical signaling component, thereby binding the plurality of different optical signaling components  
28 to said feature.

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1 41. (Currently Cancelled)

2 42. (Currently Amended) A method for probing an object with ~~labeled~~-probes to detect if  
3 any of a plurality of specific features are part of the object, using an imaging system that does not  
4 spatially resolve locations of the ~~labeled~~-probes on any specific feature, wherein such ~~labeled~~-probes  
5 can be attached to each such feature, the method comprising the steps of:

6 (a) for each specific feature to be detected, providing at least one ~~labeled~~-probe  
7 that selectively couples to a corresponding specific feature, wherein each ~~labeled~~-probe comprises a  
8 binding element that selectively binds to at least a portion of the specific feature, and at least one  
9 optical signaling component that is bound to the specific feature by the binding element;

10 (b) exposing said object to said at least one ~~labeled~~-probe for each specific feature  
11 to be detected, under conditions that cause each labeled probe to couple to at least a portion of its  
12 corresponding specific feature, if that corresponding specific feature is part of said object, such that at  
13 least two different optical signaling components become bound to each specific feature that is part of  
14 said object, each of said at least two different optical signaling components that is bound to each  
15 specific feature being uniquely optically discriminable;

16 (c) ~~simultaneously detecting light from all optical signaling components bound to~~  
17 ~~any specific feature that is part of said object, producing a corresponding signal; and~~ collecting light  
18 from said object along a collection path, the light that is collected comprising light corresponding to each of  
19 the plurality of different optical signaling components that has been simultaneously collected;

20 (d) ~~analyzing the signal to detect each optical signaling component bound to any~~  
21 ~~specific feature that is part of the object, thereby determining which specific feature is part of the object~~  
22 dispersing the light that is traveling along the collection path into a plurality of light beams, as a  
23 function of a plurality of different discriminable characteristics of the light;

24 (e) focusing each of the plurality of light beams to produce a respective image  
25 corresponding to that light beam, thereby simultaneously generating a plurality of images, locations of  
26 ~~labeled~~-probes bound to said feature included in the plurality of images being optically discriminated;

27 (f) detecting the plurality of images to produce a signal indicative of each optical  
28 signaling component, such that a different signal is produced for each of the plurality of images; and

29 (g) analyzing the signals produced for each of the plurality of images to determine  
30 which specific feature is part of the object.

1           43. (Currently Amended) The method of Claim 42, wherein the step of exposing said object  
2 to said at least one ~~labeled~~ probe comprises the step of exposing said object to a ~~labeled~~ probe having  
3 a plurality of different optical signaling components, thereby binding the plurality of optical signaling  
4 components to said corresponding specific feature that is part of the object.

5           44. (Previously Presented) The method of Claim 42, wherein said object comprises a  
6 biological cell, and each feature comprises a cellular component.

7           45. (Currently Cancelled)

8           46. (Currently Amended) The method of Claim 43, wherein the step of exposing said object  
9 to a ~~labeled~~ said at least one probe comprises the step of exposing said object to at least two ~~labeled~~  
10 probes selected to selectively bind to different portions of a first specific feature, each of said at least  
11 two ~~labeled~~ probes comprising:

12                   (a) a binding element that selectively binds to at least a portion of the first specific  
13 feature; and

14                   (b) at least one optical signaling component that is bound by the binding element  
15 to said at least a portion of the first specific feature, such that one of the at least two ~~labeled~~-probes  
16 comprises a different optical signaling component, so that a plurality of different optical signaling  
17 components are bound to the first specific feature.

18           47. (Currently Cancelled)

19           48. (Currently Cancelled)

20           49. (Previously Presented) The method of Claim 42, wherein each optical signaling  
21 component comprises a fluorescent dye, further comprising the step of directing sufficient energy  
22 toward said object, such that the fluorescent dye is excited to emit a fluorescent light comprising a  
23 uniquely discriminable characteristic of the optical signaling component.

24           50. (Previously Presented) The method of Claim 42, wherein an optical signature of said  
25 plurality of optical signaling components bound to each specific feature is uniquely discriminable  
26 based on an intensity of multiplexed light from the plurality of optical signaling components.

27           51. (Currently Amended) The method of Claim 42, wherein a spectral signature of the  
28 plurality of optical signaling components bound to a specific feature is uniquely discriminable based  
29 on a spectral composition of light from the plurality of optical signaling components.

30           52. (Currently Cancelled)

1           53. (Currently Cancelled)

2           54. (New) A method for detecting a feature using an imaging system, where the feature is  
3 part of an object and a probe can be attached to the feature, comprising the steps of:

4               (a)     providing at least one labeled probe that selectively binds to said feature,  
5 wherein said at least one labeled probe comprises a binding element that selectively binds to at least a  
6 portion of said feature, and at least one optical signaling component;

7               (b)     exposing said object to said at least one labeled probe under conditions that  
8 cause said at least one labeled probe to bind to at least a portion of said feature, if said feature is part  
9 of said object, such that a plurality of different optical signaling components become bound to said  
10 feature;

11              (c)     collecting light from said object along a collection path, while there is relative  
12 motion between the object and an apparatus employed to collect the light, the light that is collected  
13 comprising light corresponding to each of the plurality of different optical signaling components that has  
14 been simultaneously collected;

15              (d)     focusing the collected light to produce an image corresponding to the object,  
16 locations of labeled probes bound to said feature included in the image being optically discriminated but not  
17 spatially discriminated in the image;

18              (e)     detecting the image to produce a signal indicative of each optical signaling  
19 component bound to said feature; and

20              (f)     analyzing the signal to determine if a spectral component due to each optical  
21 signaling component bound to said feature is present in the image, thereby establishing that said feature  
22 is part of the object.

23           55. (New) A method for probing an object with labeled probes to detect if any of a plurality  
24 of specific features are part of the object, using an imaging system that does not spatially resolve  
25 locations of the labeled probes on any specific feature, wherein such labeled probes can be attached  
26 to each such feature, the method comprising the steps of:

27               (a)     for each specific feature to be detected, providing at least one corresponding  
28 labeled probe that selectively couples to the specific feature, wherein each labeled probe comprises a  
29 binding element that selectively binds to at least a portion of the specific feature, and at least one  
30 optical signaling component that is bound to the specific feature by the binding element;

1 (b) exposing said object to said at least one labeled probe for each specific feature  
2 to be detected, under conditions that cause each labeled probe to couple to at least a portion of its  
3 specific feature to which it corresponds, if that specific feature is part of said object, such that at least  
4 two different optical signaling components become bound to each specific feature that is part of said  
5 object, each of said at least two different optical signaling components that is bound to each specific  
6 feature being uniquely optically discriminable;

7 (c) simultaneously detecting light from all optical signaling components bound to  
8 any specific feature that is part of said object while there is relative motion between the object and an  
9 apparatus employed to detect the light, producing a corresponding signal, such that the signal is produced  
10 without employing an interferometer to affect the light that is detected; and

11 (d) analyzing the signal to detect each optical signaling component bound to any  
12 specific feature that is part of the object, thereby determining which specific feature is part of the object.  
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